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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,791	01/11/2002	Richard J. Assarabowski	C-2536	9111

7590 10/16/2003

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EXAMINER	
YUAN, DAH WEI D	
ART UNIT	**PAPER NUMBER**
1745	

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DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

5

Office Action Summary	Application No.	Applicant(s)
	10/043,791	ASSARABOWSKI ET AL.
	Examiner	Art Unit
	Dah-Wei D. Yuan	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 May 2003 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 8 is/are allowed.

6)☒ Claim(s) 1-7 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

METHOD AND APPARATUS FOR PREVENTING WATER IN FUEL CELL POWER PLATNS FROM FREEZING DURING STORAGE

Examiner: Yuan S.N. 10/043,791 Art Unit: 1745 July 15, 2003

Detailed Action

1. The Applicant's amendment filed on May 22, 2003 was received. The abstract was amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (Paper No. 5).

Claim Rejections - 35 USC § 103

3. The claim rejections under 35 U.S.C.103(a) as being unpatentable over Acker (US 6,489,052) in view of Gebhardt et al. (US 2002/0058165 A1) on claims 1,4-6 are maintained. The rejection is repeated below for convenience.

Acker teaches a fuel cell system that converts chemical energy of a fuel into electrical energy, typically by oxidizing the fuel, i.e., a fuel cell power plant. The fuel cell system comprises a fuel cell stack, which has a solid polymer ion exchange membrane (electrolyte) sandwiched between a anode gas diffusion layer (anode) and a cathode gas diffusion layer (cathode). The system further comprises a cooling mechanism such as cooling plates (cooler) which are commonly installed within the fuel cell stack between adjacent single cells to remove heat generated during fuel cell operation. The fuel cell system using hydrogen as a fuel may include a fuel processing system such as a reformer (fuel supply means) to produce hydrogen.

The hydrogen-containing reactant is supplied to the anode while oxygen-containing air is used as a source of oxidant in the cathode. A cooling subsystem (water management system) in the fuel cell system is responsible for the coolant flow in order to control or optimize the operating temperature of the fuel cell stack. The casing of the fuel cell system (14) in Figure 2 is considered as a thermal insulating means which encloses the fuel cell stack and the cooling subsystem. See Column 1, Lines 13-14, 53-56, 66 to column 2, line 3; Column 2, Lines 54-61; Column 3, Lines 9-11; Column 8, Lines 26-29. .

However, Acker does not teach to incorporate a catalytic fuel burner means in the thermal insulating enclosure means of the fuel cell system. Gebhardt et al. teach a fuel cell system having an improved cold-starting capability. The fuel cell stack in the fuel cell system is heated with waste heat from combustion of a primary and/or a secondary fuel in a catalytic burner. Hydrogen, which can be produced in situ by electrolysis or by a reformer, is used as the fuel. The catalytic burner contains surfaces that are covered with a catalyst in which a highly exothermic reaction takes place in a controlled manner. There is also no open flame during combustion with the catalytic burner producing only heat. As a result, the exothermic energy released by the catalytic burner is used as heat during cold-starting the fuel cell system. See paragraphs 11, 23 and claim 1. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the catalytic burner into the fuel cell thermal insulating enclosure of Acker, because Gebhardt et al. teach the use of a catalytic burner to provide heat on the fuel cell stack in order to improve cold-starting capability of the fuel cell power plant.

With respect to claim 4, Gebhardt et al. teach air can be used as a source of oxidant to be supplied to the catalytic burner. See Claim 4. As mentioned above, hydrogen is used as fuel for the catalytic burner. Therefore, it would have been obvious to one of ordinary skill in the art to use air as the oxidant in the catalytic burner in the fuel cell thermal insulating enclosure of Acker, because Gebhardt et al. teach the use of a catalytic burner to provide heat on the fuel cell stack in order to improve cold-starting capability of the fuel cell power plant.

With respect to claim 5, Acker teaches the hydrogen may be provided from hydrogen tanks or other hydrogen storage systems such as hydrogen storage alloys. See Column 5, Lines 18-20.

With respect to claim 6, Acker teaches casing of the fuel cell system (14), i.e., a thermal insulating means, is used to enclose the fuel cell stack and the cooling subsystem. See Figure 2; Column 8, Lines 26-29.

4. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Acker (US, 6,489,052), Gebhardt et al. (US 2002/0058165) and Tomomura et al. (JP 59-152210) on claims 2,3,7 are maintained. The rejection is repeated below for convenience.

With respect to claims 2,3, the disclosure of Acker and Gebhardt et al. differs from Applicant's claims in that Acker and Gebhardt et al. do not discuss the operating temperature range of the catalytic burner. Tomomura et al. disclose the use of a catalytic burner to have selective combustion of hydrogen gas by using platinum as the catalyst. Thus, the burner is operated at temperatures ranging from 100° to 250°C (212° to 480°F). See abstract. Therefore,

it would have been obvious to one of ordinary skill in the art to incorporate the catalytic burner disclosed by Tomomura in the fuel cell power plant of Acker and Gebhardt, because Tomomura et al. teach the hydrogen can be selectively combusted at a temperature range of 212° to 480°F when platinum catalyst is used in the catalytic burner.

With respect to claim 7, Acker teach a fuel cell that has proton exchange membrane and uses hydrogen as the fuel. See Column 1, Lines 33-35; Column 5, Lines 11-13. However, the disclosure of Acker and Gebhardt et al. do not discuss the operating temperature range of the catalytic burner. Tomomura et al. disclose the use of a catalytic burner to have selective combustion of hydrogen gas by using platinum as the catalyst. Thus, the burner is operated at temperatures ranging from 100° to 250°C (212° to 480°F). See abstract. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the catalytic burner disclosed by Tomomura in the fuel cell power plant of Acker and Gebhardt, because Tomomura et al. teach the hydrogen can be selectively combusted at a temperature range of 212° to 480°F when platinum catalyst is used in the catalytic burner.

Allowable Subject Matter

5. Claim 8 is allowed. The following is a statement of reasons for the indication of allowable subject matter: The invention of independent claim 8 recites a method of preventing freezing of water in a fuel cell power plant during shutdown comprising the steps of (a) selectively flowing fuel and oxidant to a catalytic fuel burner during shutdown; (b) convectively flowing the heated gas into fuel cell power plant; and (c) thermally insulating the parts of the fuel

cell power plant as stated in the claim. The closest prior arts of record, Acker and Gebhardt et al., do not teach or suggest the use of a catalytic fuel burner during shut down to provide heated gas to the fuel cell power plant.

Response to Arguments

6. Applicant's arguments filed on May 22, 2003 have been fully considered but they are not persuasive.

Applicant's principle arguments are

Ackers reference does not teach the inclusion of a thermal insulating means as an enclosure for freeze-sensitive components of a fuel cell power plant system.

In response to Applicant's arguments, please consider the following comments.

The limitation "thermal insulating means" in claim 1 is interpreted as "a structure that prevents transfer of heat". Acker teaches the fuel cell system (14) is used to provide enhanced air purification for stationary applications. The system resides outside of an air space (12) (e.g., a house) and is connected to into an air circulation path with an interior region of the air space via a cathode inlet conduit (18) and a cathode outlet conduit (20). See Column 5, Lines 41-56; Figure 2. The system is analogous to a residential heat pump unit, which has a casing to prevent the components ~~for~~ from direct exposure to the ambient. Thus, the casing of the fuel cell system is considered as a thermal insulating means, which encloses the fuel cell stack and the cooling subsystem.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan
July 15, 2003

Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700